



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,095	12/16/2005	Brian A. Hunter	huntcb01.034	2465
25247 GORDON E NELSON PATENT ATTORNEY, PC 57 CENTRAL ST PO BOX 782 ROWLEY, MA 01969	7590 11/07/2008		EXAMINER VON BUHR, MARIA N	
			ART UNIT 2121	PAPER NUMBER
			NOTIFICATION DATE 11/07/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

genelson@northshorepatents.com  
mbaillie@northshorepatents.com

# Office Action Summary

**Application No.**

10/561,095

**Applicant(s)**

HUNTER ET AL.

**Examiner**

M.N. VON BUHR

**Art Unit**

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 December 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

1. This application is a continuation of Serial No. PCT/US04/19860 and is, therefore, accorded the benefit of the earlier filing date of 18 June 2004. Any previously presented rejections or objections which are not expressly repeated in this Office action are hereby withdrawn.

2. Applicant's claim for domestic priority under 35 U.S.C. §119(c) is acknowledged.

3. Examiner acknowledges receipt of Applicant's response to the previous Office action, received 17 June 2008 and 16 July 2008; which introduce claims 34 and 35. Claims 1-35 are now pending in this application.

4. Examiner notes that the instant copy of the claims, submitted with the 16 July 2008 amendment, is incomplete since the text of the body of claim 18 is missing. In order to expedite prosecution, for the remainder of this Office action, the text of this claim (since it is marked as "original") is assumed to be as originally filed on 16 December 2005. Applicant is required to correct this omitted text in any future listings of the claims.

5. The drawings are objected to, because Figures 4, 6-10, 12 and 13 include shading which makes them illegible. Substitute drawings are required in response to this Office action.

6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by Examiner, Applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. Examiner notes that, at pages 3-4, 13, 17, 20, 28, 33, 34 and 36, Applicant cites a co-pending application, SN 10/018696. First, the citation of this application is incomplete. Appropriate correction of this citation, including any update to its status, is required in response to this Office action.

Second, it is unclear from the context of such citation, whether this application is being incorporated by reference. If such was the intent, then the incorporation has been improperly executed. Accordingly, the content of this co-pending application cannot be relied upon for any subject matter essential to the instant claims.

8. Examiner further notes that any incorporation by reference of an application in a printed United States patent constitutes a special circumstance under 35 U.S.C. §122 warranting that access of the original disclosure of the application be granted. An incorporation by reference is interpreted as a waiver of confidentiality of only the original disclosure as filed, and not the entire application file, *In re Gallo*, 231 USPQ 496 (Comm'r Pat. 1986). If Applicant objects to access to the entire application file, two copies of any information considered to be incorporated by reference must be submitted along with the objection. Failure to provide the material within the period provided will result in the entire application (including prosecution) being made available to petitioner. The Office will not attempt to separate the noted materials from the remainder of the application. Compare *In re Marsh Engineering Co.*, 1913 C.D. 183 (Comm'r Pat. 1913).

9. The specification is objected to, because on pages 37-41 Applicant has cited various "software components," trademarked products and "Matlab" program. Such citations are incomplete. Appropriate correction of these citations is required in response to this Office action.

10. Claims 18 and 24 (as originally filed on 16 December 2005) are objected to, because they do not include any terminating punctuation. Appropriate correction is required in response to this Office action.

11. 35 U.S.C. §101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 1-35 are rejected under 35 U.S.C. §101, because the claimed invention is directed to non-statutory subject matter. In this case, the instant claims are directed to a mathematical algorithm (i.e.; the determination of a probability), which falls within a judicial exception to the statutory classes of invention.

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by Applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by Applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by Applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 1, 4, 6-10 and 13-26 stand rejected under 35 U.S.C. §102(c), as being clearly anticipated by Bernhardt (U.S. Patent Application Publication No. 2003/0055765).

a. As presented in the previous Office action, as per claim 1, Bernhardt teaches “A method of analyzing a set of assets selected from a plurality of thereof, historic returns data for the assets of the plurality being stored in storage accessible to a processor” ([0007];[0008]) “and the method comprising the steps performed in the processor of: receiving inputs indicating assets selected for the set and for each asset, a desired minimum return” ([0029];[0087]); “using the historic returns data to determine a probability that at least one of the selected assets will not provide the desired minimum return indicated for the asset; and outputting the probability” ([0029]-[0033]).

As per claim 4, Bernhardt teaches “A method of optimizing a set of assets, historic returns data for the assets being stored in storage accessible to a processor and the method comprising the steps performed in the processor of: receiving inputs indicating a set of scenarios for the set of assets, each scenario having values which are used in optimizing the set of assets and which vary stochastically between two extremes and a probability of occurrence for the scenario” ([0029]-[0033];[0144]-[0145]); “and determining weights of the assets in the set such that the worst-case value of the set of assets is optimized over the set of scenarios” ([0144]-[0146]).

As per claim 6, Bernhardt teaches “The method of optimizing set forth in claim 4 wherein: a scenario in the set of scenarios may correspond to the historical returns data for the assets in the set of assets” ([0144]-[0145]).

As per claim 7, Bernhardt teaches “The method of optimizing set forth in claim 4 wherein: a scenario in the set of scenarios may include certain assets in the set of assets which are highly correlated” ([0144]).

As per claim 8, Bernhardt teaches “The method of optimizing set forth in claim 4 wherein: a scenario in the set of scenarios may correspond to outliers in the historical returns data” ([0119];[0144]).

As per claim 9, Bernhardt teaches “The method of optimizing set forth in claim 4 further comprising the step of: receiving inputs indicating additional constraints to which the set of assets being optimized is

subject; and in the step of determining weights of the assets, determining the weights subject to the additional constraints” ([0030];[0023]).

As for claim 10, the same citations applied to claims 1 and 4 above apply as well for this claim.

As per claim 13, Bernhardt teaches “The method set forth in claim 10 wherein: optimizing the weights of the assets is done using robust optimization” ([0017]-[0025]).

As per claim 14, Bernhardt teaches “The method set forth in claim 13 wherein: the robust optimization optimizes over a set of user-specified scenarios, each scenario having values which are used in optimizing the set of assets and which vary stochastically between two extremes and a probability of occurrence for the scenario” ([0144]-[0146]).

As per claim 15, Bernhardt teaches “The method set forth in claim 10 wherein: optimizing the weights of the assets is done subject to a constraint that the probability that the set of assets yields a desired minimum return is greater than a user-specified value  $a$ ” ([0029]-[0030]).

As per claim 16, Bernhardt teaches “The method set forth in claim 15 wherein: the optimization is done subject to a plurality of constraints ( $1..n$ ), a constraint  $c_{hi}$  specifying that the probability that the set of assets yields a desired minimum return that is greater than a user-specified value  $a_{ir}$ ” ([0029]-[0030]).

As per claim 17, Bernhardt teaches “The method set forth in claim 15 wherein: optimizing the weights of the assets in the set is done using robust optimization” ([0017]-[0025]).

As per claim 18, Bernhardt teaches “The method set forth in claim 17 wherein: the robust optimization optimizes over a set of user-specified scenarios, each scenario including a mean return and a covariance matrix, each of which varies stochastically between two extremes, and a probability of occurrence for the scenario” ([0078]-[0079];[0032]).

As per claim 19, Bernhardt teaches “The method set forth in claim 10 wherein: the asset may have a negative weight” ([0033]).

As per claim 20, Bernhardt teaches “The method set forth in claim 10 wherein: the sum of the weights of the assets in the set may exceed 1” ([0033]).

As per claim 21, Bernhardt teaches “The method set forth in claim 10 wherein: optimizing the weight of the assets is done subject to one or more additional constraints” ([0039]-[0042];[0052]-[0061]).

As per claim 22, Bernhardt teaches “The method set forth in claim 21 wherein: the additional constraint restricts the sum of the weights of the assets belonging to a selected subset of the assets in the set” ([0039]-[0042];[0052]-[0061]).

As per claim 23, Bernhardt teaches "The method set forth in claim 21 wherein: the additional constraint constrains the weight of an asset such that the amount of the asset in the set is above a minimum investment threshold" ([0029]-[0030]).

As per claim 24, Bernhardt teaches "The method set forth in claim 21 wherein; the additional constraint limits constrains the set's downside risk to be less than a predetermined value  $b$ " ([0029]-[0030]).

As per claim 25, Bernhardt teaches "The method set forth in claim 24 wherein; the additional constraint is computed from the worst draw-down for each asset" ([0034];[0038]).

As per claim 26, Bernhardt teaches "The method set forth in claim 24 wherein: the additional constraint is computed from the set's average return and standard deviation" ([0031]).

b. Applicant argues that "the difficulty here is that the cited locations in Bernhardt disclose nothing whatever about the claim's "probability that at least one of the selected assets will not provide the desired minimum return indicated for the asset". Moreover, as revealed by a Lexis search for portions of the reference within 25 words of the search term probability, the sum total of disclosure in the reference concerning "probability" is the following: ... 'invention is now given to demonstrate the potential improvement of accuracy in the method as against the prior art Markowitz approach. [0144] Synthetic data was generated for 10 correlated financial assets The underlying probability density function for the price increments was taken as a 'Student' distribution with parameter  $d$ [equals]6 giving power law tails of order  $O(x^{-7/2})$  for individual ... each series were taken as 'training data'. The time series for the combined portfolio was generated (over the whole data set) and histograms of the price increments of the portfolio obtained as a numerical approximation to its probability density function. These histograms are shown below using a logarithmic y-axis (probability) in order to show the differences in the tails of the distributions which are most important for risk control. [0146] As can be clearly seen the probability of large negative fluctuations is significantly reduced by using algorithm 1 relative to the classical Markowitz approach.' None of this has anything to do with the claimed method steps" (pages 8-9 of the response dated 17 June 2008). This argument is not persuasive, because there is no requirement that Bernhardt use the exact same language Applicant is using to describe the invention. In this regard, Bernhardt teaches the instantly claimed determination of probability by the various citations listed above, not by the mention of the term as cited by Applicant. Applicant has not specified how the various citations listed above fail to determine the instantly claimed probability. Accordingly, a mere allegation that the reference does not teach the claimed subject matter cannot be considered to be persuasive. It is noted that the remainder of the remarks presented at pages 9-10 of this cited response fall into this same category of mere allegations. The functions instantly claimed (regardless of terminology used) are deemed to be taught by Bernhardt at the passages cited above.

c. Hence, claims 1, 4, 6-10 and 13-26 stand rejected under 35 U.S.C. §102(c), as being clearly anticipated by Bernhardt (U.S. Patent Application Publication No. 2003/0055765).

15. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 5, 11, 12, 28-33 stand rejected under 35 U.S.C. §103(a), as being unpatentable over Bernhardt (U.S. Patent Application Publication No. 2003/0055765) in view of Columbus et al. (U.S. Patent Application Publication No. 2002/0022988).

a. As presented in the previous Office action, as for claims 5, 11, 12 and 28-33, Bernhardt discloses the limitations of claims 1, 4 and 10 above, and further discloses quantifying the risk of an asset ([00145], i.e., risk control). However, Bernhardt fails to disclose the limitations of claims 5, 11, 12 and 28-32. However, Columbus et al. teach that the value of the set of assets is a real option value and that the objective function is adjusted by assigning a premium or a discount to the real value of the assets ([0007]). Columbus et al. further teach an objective function to take tax sensitivity of an asset (Fig. 5c). Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of Bernhardt with the method of Columbus et al., because it would provide an improved system for evaluating performance based on returns observed after a particular revision, historical consistency and/or the number of revisions made by the analyst or inventing entity ([0016]).

b. Applicant argues that "The 'anticipated cash flow stream 30, the discount function 34, and present value of future cash flow are calculated' [of Columbus et al.] is of course a description of how the net present value of an asset is calculated, not a description of how the asset's real option value is calculated. For the difference between the net present value, or NPV, of an asset and its real option value, see the current Wikipedia definitions of the terms. It should further be pointed out here that a Lexis search of Columbus for references to the term "real option" found no occurrences of the term" (pages 10-11 of the response dated 17 June 2008). This argument is not persuasive, because there is no requirement that the references use the exact same language Applicant is using to describe the invention. In this regard, the references are deemed to teach the instantly claimed functions by the various citations listed above, not by any mention or lack thereof of a particular term as cited by Applicant. Furthermore, Applicant has not specified how the various citations listed above fail to determine the instantly claimed "real option" function. A mere allegation that



the reference “of course” does not teach the claimed subject matter cannot be considered to be persuasive. It is further brought to Applicant’s attention that the instant specification indicates that “real option” valuation is well-known (see page 2 of the instant specification). Hence, it would have been well within the scope of one having ordinary skill in the art to provide any modifications to the teaching of Columbus et al. to arrive at this well-known modeling, for the reasons presented by Applicant; namely, that uncertainty is better accounted for.

c. Accordingly, claims 5, 11, 12 and 28-33 stand rejected under 35 U.S.C. §103(a), as being unpatentable over Bernhardt (U.S. Patent Application Publication No. 2003/0055765) in view of Columbus et al. (U.S. Patent Application Publication No. 2002/0022988).

17. The indicated allowability of claims 2, 3 and 27 is withdrawn in view of the newly discovered reference(s) to Eapen (U.S. Patent Application Publication No. 2004/0138897). Rejections based on the newly cited reference(s) follow.

18. Claims 1-35 are rejected under 35 U.S.C. §102(c), as being clearly anticipated by Eapen (U.S. Patent Application Publication No. 2004/0138897), which discloses “a method and system to select projects from available projects and to allocate resources to departments to maximize the incremental value gained within a desired execution risk. Probability distribution of departmental capacities is created by performing a Monte-Carlo simulation considering probabilities of future events that may increase or decrease capacity. Real options based value is calculated for all available projects at the start and end of the time period and a subset of the highest incremental value projects is selected to form a trial portfolio. Probability distribution of resource demand is created in each department through a Monte-Carlo simulation of the trial portfolio by specifying each project’s resource needs. The capacity and demand characteristics are compared and an execution risk is calculated. If the execution risk is not within a desired level, projects in the trial portfolio are added, deleted or replaced or departmental capacities are changed such that the execution risk is brought to the desired level. At the end of this iterative process, the best possible selection of projects as well as the best possible allocation of capacities to departments are obtained and reported” (abstract).

As per the claims, Eapen teaches an application characterized by an “Input mechanism for specifying the probabilistic characteristics of the events that affect available capacity of resources within departments,” “Monte-Carlo simulation engine to create the probability distribution of departmental capacities,” “Real options analysis engine to calculate the value of the project at the start and end of the time period considered,” “Output mechanism that shows the projects and incremental values in a descending fashion so that a subset of highest incremental value projects can be selected,” “Input mechanism for specifying the

probabilistic characteristics of resource demand,” “Monte-Carlo simulation engine to create a probabilistic resource demand for all departments,” “Execution risk calculator considering the probabilistic capacities ... of departments and the probabilistic resource demands ... for the departments,” and “Output mechanism that shows resource demand, execution capacity and execution risk in all departments” (paragraphs 0061-0068), wherein “An execution risk is calculated for each department by comparing the probability distribution of resource demand against probability distribution of available capacity. Execution risk is defined as the probability that the department will not have enough capacity to meet the resource demand” (paragraph 0083) and “Alternately, an overall execution risk for the entire company (including all departments) can be calculated and used as the measure for selecting the portfolio” (paragraph 0084). See, also, paragraph 0001.

**19.** This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. §103(a), Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for Examiner to consider the applicability of 35 U.S.C. §103(c) and potential 35 U.S.C. §102(c), (f) or (g) prior art under 35 U.S.C. §103(a).

**20.** The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. Applicant is advised to carefully review the cited art, as evidence of the state of the art, in preparation for responding to this Office action.

**21.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to M.N. VON BUHR whose telephone number is (571)272-3755. The examiner can normally be reached on M-F (9am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on 571-272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/M.N. VON BUHR/  
Primary Examiner, Art Unit 2121